LIVERMORE LAB
REPORT

A weekly review of scientific and technological achievements from Lawrence Livermore National Laboratory, May 12-16, 2014.

CBCnews IN A GALAXY FAR, FAR AWAY

LLNL researchers and international collaborators have refined the orbit and size of the exoplanet Beta Pictoris b.

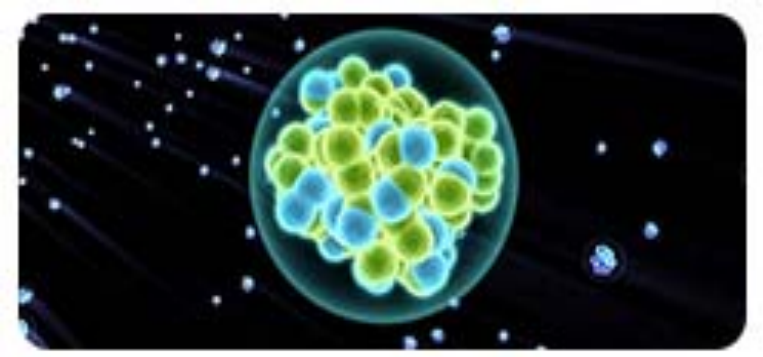
Using one of the world's largest telescopes, a Lawrence Livermore team and international collaborators have tracked the orbit of a planet at least four times the size of Jupiter.

The scientists were able to identify the orbit of the exoplanet Beta Pictoris b, which sits 63 light years from our solar system, by using the Gemini Planet Imager's (GPI) next-generation, high-contrast adaptive optics (AO) system. This approach is sometimes referred to as extreme AO.

The Gemini Planet Imager snapped an amazingly clear and bright image of the gas giant after an exposure of just one minute.

To read more, go to *CBC news*.

Forbes IN AN ELEMENT OF ITS OWN



Element 117, first discovered by Lawrence Livermore researchers and Russian collaborators, has been reproduced by an international consortium.

The official Periodic Table of the Elements is one step closer to adding element 117 to its ranks. That's thanks to an international team of scientists that was able to successfully create several atoms of element 117, which is currently known as Ununseptium until it's given an official name.

Lawrence Livermore teamed with the Joint Institute for Nuclear Research in Russia (JINR) in 2004 to discover elements 113 and 115. The LLNL/JINR team then jointly worked with researchers from the Research Institute for Advanced Reactors (Dimitrovgrad), Oak Ridge National Laboratory, Vanderbilt University and the University of Nevada, Las Vegas, to discover element 117 in 2010.

However, before an element can be officially added to the Periodic Table of Elements, its discovery must be independently confirmed.

Ununseptium, like many superheavy elements near the end of the periodic table, is incredibly unstable, existing only for fractions of a second before decaying into other elements.

To read more, go to *Forbes*.

COMPUTERWORLD A CATALYST TO CRUNCH NUMBERS

The Catalyst supercomputer at Lawrence Livermore employs a Cray CS300 architecture modified specifically for data-intensive computing.

Although you can't "see" unstructured data or the treasures hidden in it, in 10 years we could be drowning in it as big data experts predict the global data volume will exceed 35 trillion gigabytes.

A massive amount of crunching power from Catalyst, a "first-of-a-kind" supercomputer at Lawrence Livermore, is now available to American industry and academia for collaborative research.

"Over the next decade, global data volume is forecasted to reach more than 35 zettabytes," (a zettabyte is a trillion gigabytes, while a gigabyte is one billion bytes)" said Fred Streitz, director of the HPC Innovation Center (HPCIC) at Lawrence Livermore. "That enormous amount of unstructured data provides an opportunity. But how do we extract value and inform better decisions out of that wealth of raw information? LLNL believes the answer is the sexy beast Catalyst."

To read more, go to *Computerworld*.

NATURE WORLD NEWS COOL IT

A volcanic eruption in the southwestern part of Iceland's Eyjafjallajoekull glacier released a significant volume of ash into the air. Lawrence Livermore scientists say volcanic eruptions may mask the effects of global warming.

Volcanic eruptions that have been spewing over the last 14 years may be partially responsible for the cooling of Earth and slowing down the effects of global warming.

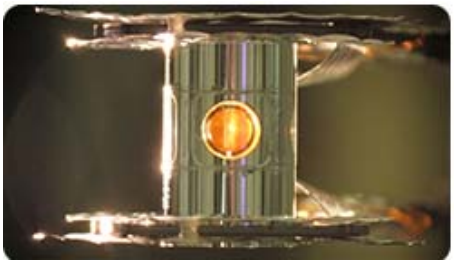
Lawrence Livermore researchers attribute this helping hand to the 17 eruptions from 1998 to 2012 that pumped sulfur dioxide into Earth's upper atmosphere. The molecule formed liquid particles that reflected sunlight back to space rather than to the Earth's surface, moderating the larger-scale warming of the planet surface.

This discovery undermines the Intergovernmental Panel on Climate Change's (IPCC) computer models, which predict a non-stop warming of the planet thanks to human activity. Its models assumed that volcanic aerosols would eventually fall to the ground and not remain in the atmosphere.

"That's not what happened in the real world," said lead author of the study Benjamin Santer, a climate scientist at Lawrence Livermore. "The real world has experienced a partial cooling effect associated with this uptick in volcanic activity."

To read more to go *Nature World News*.

YAHOO! BRINGING NUCLEAR POWER BACK TO LIFE



A metallic case called a hohlraum holds the fuel capsule for NIF experiments.

While wind and solar are attractive options, they still can't supply energy on the scale that the world consumes it -- hence researchers are creating some distinctly out-there ideas for new 'safe' nuclear power.

One option may follow in the footsteps of Lawrence Livermore's National Ignition Facility. The National Ignition Facility combines two areas of research -- nuclear weapons testing without breaking treaties, and investigating the idea of fusion, where atoms join together rather than break apart.

If someone solves the puzzle and creates fusion, an energy option may follow -- it's clean, and uses water as fuel. Current reactors work using nuclear fission, which generates less power -- and creates waste. The National Ignition Facility is the size of a football stadium, and its 192 lasers blast out 1,000 times more electricity than Americans use.

To read more, go to *Yahoo*.

LLNL applies and advances science and technology to help ensure national security and global stability. Through multi-disciplinary research and development, with particular expertise in high-energy-density physics, laser science, high-performance computing and science/engineering at the nanometer/subpicosecond scale, LLNL innovations improve security, meet energy and environmental needs and strengthen U.S. economic competitiveness. The Laboratory also partners with other research institutions, universities and industry to bring the full weight of the nation's science and technology community to bear on solving problems of national importance. To send input to the *Livermore Lab Report*, send e-mail